

I. SOIL – Resource Quality Criteria

A. EROSION

1. Sheet and Rill – Soil erosion caused by overland flow of water.

Criteria are met when measures are planned so that the estimated sheet and rill erosion rates are reduced to the tolerable level (T) whereby long-term soil degradation is prevented and a high level of the soil's productivity can be sustained.

2. Wind – Soil erosion caused by wind energy.

Criteria are met when measures are planned so that the estimated wind erosion rates are reduced to the tolerable level (T) whereby long-term soil degradation is prevented and a high level of the soil's productivity can be sustained.

3. Concentrated flow

- a. Ephemeral Gully/Concentrated Flow – Concentrated flow channels along depressional watercourses that begin where overland flow, including rills, converge. On cropland, these channels are obscured by tillage operations.

Criteria are met when the necessary management and/or structural measures are planned that treat the area to control erosion in flow channels.

- b. Classic Gully – Gullies are channels that may grow or enlarge from year-to-year by headcutting, lateral widening and deepening. They are too deep to be crossed by normal farming operations.

Criteria are met when measures are planned that limit erosion from classic gullies by stabilizing the channel bottom and the gully sidewalls to prevent erosive velocities. In cases where the decisionmaker cannot solve the problem alone, the Conservation Treatment Unit (CTU) criteria will be met when the planned actions of the decisionmaker are not contributing to gully erosion.

4. Streambank – Sloughing of banks caused by stream flow, overbank flow, unstable soils, obstructions, unstable channel bottom, livestock, or all of these.

Criteria are met when measures are planned that stabilize streambanks or return the stream to equilibrium. In cases where the decisionmaker cannot solve the problem alone, the Conservation Treatment Unit (CTU) criteria will be met when the planned actions of the decisionmaker are not contributing to streambank erosion.

5. Irrigation Induced – Erosion caused by excessive amounts and/or velocity of water from sprinkler irrigation activities or by water conveyances and tracks from center pivots and traveling guns.

Criteria are met when measures are planned that provide erosion reduction to tolerable levels through the use of irrigation water management as stated in the state irrigation guide and through companion agronomic management and engineering practices. *Irrigation Water Management* is an essential practice. Alternative type of irrigation applications and equipment may be necessary.

6. Soil Mass Movement – Soil slippage, landslides, or slope failure, normally on hillsides, in deep cuts, or through unstable soil on sloping land, that creates a large volume of soil movement.

Criteria are met when measures are planned and prevent or minimize soil mass movement at a rate that does not exceed normal geological processes, or avoidance of areas having severe soil limitations. Treatment may preclude use of some conservation practices that increase infiltration or drainage problems. In cases where the decisionmaker cannot solve the problem alone, the CTU criteria will be met when the actions of the decisionmaker no longer contribute to the problem.

7. Roadbanks and Construction Sites – The erosion as identified is causing problems and damage onsite and offsite.

Roadbanks – Criteria are met when measures are included to shape slopes to an acceptable grade, to stabilize banks, and to safely convey overland and channel flow.

Construction Sites – Criteria are met when measures of a temporary or permanent nature are planned to dispose of and safely convey excess surface water; to stabilize the site with vegetative or other materials as needed; and to prevent or control sediment leaving the site. Must meet criteria contained in North Carolina Erosion and Sediment Control Planning and Design Manual.

8. Scoured Areas – The erosion is caused by out of bank stream flow.

Criteria are met when necessary measures are included to establish temporary or permanent vegetation, considering flow velocity, depth, and probability of occurrence, to provide protection from scouring. Criteria may set conditions where soil losses exceed the tolerable limit over a 10-year period, or other established period that will determine when permanent vegetation is necessary.

B. CONDITION

1. Soil Tilth – is the condition of the soil based on a suitable combination of mineral, air, water, and organic matter, resulting in an environment in which favorable microbial activity and chemical reactions can occur.

Criteria are met when measures are planned so that the soil condition no longer impairs the growth and vigor of the plant species of concern, restricts surface water infiltration, and limits available moisture. Soil tilth should be in a positive trend.

Soil tilth improvements will normally be achieved by the selection of high residue crops, crop residue management, and the timing, type, and extent of tillage management.

2. Soil Compaction – Compaction is excess compressing of soil particles and aggregates by machinery, livestock, and natural consolidation, thereby affecting the plant-soil-moisture-air relationship.

Criteria are met when measures are planned that provide management considerations to reduce the machinery or livestock traffic, reduce operations on wet soils, and plan proper timing of operations.

3. Soil Contaminants

- a. Excess chemical content, salinity, selenium, boron, heavy metals – includes amounts of desirable and undesirable chemical elements and compounds consisting of either organic or inorganic forms and restricts the suitable use of the soil.

Criteria are met when measures are planned that establish or adjust management, cropping rotations, or land uses that are tolerant to the present chemical content and no longer restricts a suitable use.

For salinity, criteria are met when measures are planned that controls tidewater flooding.

- b. Excess animal waste – Excess animal waste and other organics restrict the use of the soil.

Criteria are met when planned measures reduce soil contamination from animal waste and other organics to a level that no longer contributes to problems that can restrict use of the soil.

- c. Excess fertilizer – Excess fertilizer occurs if the application of fertilizer or quantity of nutrients restricts the use of the soil.

Criteria are met when planned measures reduce soil contamination from excess fertilizer to a level that no longer contributes to a restricted use of the soil. Where present or potential problems of excess nutrients are identified, criteria may require a soil test, and nutrient budget. **NUTRIENT MANAGEMENT** is an essential practice.

- d. Excess pesticides – Excess pesticides occur if the application method or the quantity of the residuals restricts the use of the soil.

Criteria are met when planned measures reduce soil contamination from excess pesticides to a level that no longer restricts use of the soil. If excess pesticides are a problem, criteria should consider the residual effects of pesticides on subsequent crops and land use. **PEST MANGEMENT** will become an essential practice.

- e. Other – pH – Controls the availability of nutrients for plant utilization.

Criteria are met when pH is adjusted to meet the requirements of the crop to be grown.

C. **DEPOSITION**

1. Onsite Damage – Occurs when deposition adversely affects vegetation and property, changes structure and texture near the soil surface, deposits infertile material, and causes management problems (such as a need to relevel land) because of depth and distribution of deposition.

Criteria are met when measures are planned that eliminate adverse contribution to the identified deposition problem. This usually involves controlling erosion processes that significantly contribute to the higher rates of sediment yields (such as ephemeral or classic gullies) to prevent harmful sediment deposits to land and property.

2. Offsite Damage – Occurs when deposition adversely affects vegetation and property, changes structure and texture near a soil surface, deposits infertile material, and causes management problems (such as the need to relevel land) because of depth and distribution of deposition.

Criteria are met when measures are planned that eliminate adverse contribution to the identified deposition problem. This usually involves controlling erosion processes that significantly contribute to the higher rates of sediment yields (such as ephemeral or classic gullies) to prevent harmful sediment deposits to land and property.

Offsite deposition damage needs to be viewed in two ways. Sometimes sediment is diluted because of the inclusion of more drainage areas and may be less severe. Conversely, sediment may be combined with sediment delivery from other sources and cause a more severe offsite deposition problem.

3. Onsite Safety – Deposition on farm roads that cause accidents, loss of life, and loss of access for emergency vehicles.

Criteria are met when planned measures resolve the identified deposition problem. This usually involves controlling erosion that has higher rates of sediment yields (such as ephemeral or classic gullies) to prevent harmful sediment deposits to land and property.

4. Offsite Safety – Deposition on roads and railroads that cause accidents, loss of life, and loss of access for emergency vehicles. Offsite practice effects are presently less than onsite because of increased distance from source problem.

Criteria are met when planned measures resolve the identified deposition problem. This usually involves controlling erosion that has higher rates of sediment yields (such as ephemeral or classic gullies) to prevent harmful sediment deposits to land and property.